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㊹発明の名称　自動化学分析装置

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明　細　書

1．発明の名称

自動化学分析装置

2．特許請求の範囲

反応容器に試料と試薬とを分注して所望項目の化学分析を行う自動化学分析装置において、試薬に関する情報を記憶している記憶媒体が設けられている試薬容器と、試薬容器から試薬を吸引する位置に配置され前記試薬情報を電磁波によって送受信可能な送受信手段とを備えたことを特徴とする自動化学分析装置。

3．発明の詳細な説明

〔発明の目的〕

（産業上の利用分野）

本発明は、試薬情報を記憶している記憶媒体が設けられている試薬容器を備えた自動化学分析装置に関する。

（従来の技術）

例えば人体から採集した血清を試料（サンプル）として用いこれに分析項目に応じた所望の試薬を反応させ、この反応液内の特定成分の濃度を例えば比色法により測定して所望項目の分析を行うようにした自動化学分析装置が知られている。このような分析装置で化学分析を行うにあたり、最近では試料と反応させる試薬を収容している試薬容器3aとして、第5図に示すように試薬の情報を示すバーコードを記録したラベル11を設けるようにしたものが用いられている。このようにバーコードラベル11を設けた試薬容器3aを用いることによって、試薬取扱いミスの防止や測定の合理化を図ることができる。

このようなバーコードラベル11は紙，樹脂，テープ等を用いて必要な試薬情報をバーコードの形で印刷することが行われている。試薬情報は予めCPU（中央演算処理装置）に記憶され、分析を行うにあたり試薬容器を分析装置の所望位置にセットしたとき読取装置によってバーコードを介してその試薬情報を読取ることにより、予めCPUに記憶されている試薬情報との照合が行われるようになっている。

（発明が解決しようとする課題）

ところで従来の自動化学分析装置で用いられているバーコードラベル付き試薬容器では次のような問題がある。

1．バーコードで表わす情報容量には制約があるので多くの試薬情報を持たせることが不可能である。

2．ランダムアクセス型の自動化学分析装置の場合、途中での分析項目の変更要求に伴いセットされた試薬容器を1度分析装置からリセットして他の試薬と交換して外部の保存庫に保存する必要性が生じるが、この間交換される試薬の個別情報をずっと記憶装置に記憶しておかねばならず、余分なメモリ容量を必要とする。

3．バーコードの読取りはイメージとして読取るため、外部保存庫から取出して分析装置の試薬庫にセットするとき、温度差によってバーコードラベル表面が結露し易いので正常に読取れない場合が生ずる。

本発明は以上のような問題に対処してなされたもので、従来問題を解決することができる自動化学分析装置を提供することを目的とするものである。

［発明の構成］

（課題を解決するための手段）

上記目的を達成するために本発明は、反応容器に試料と試薬とを分注して所望項目の化学分析を行う自動化学分析装置において、試薬に関する情報を記憶している記憶媒体が設けられている試薬容器と、試薬容器から試薬を吸引する位置に配置され前記試薬情報を電磁波によって送受信可能な送受信手段とを備えたことを特徴とするものである。

（作　用）

試薬容器からの試薬情報を電磁波によって送受信を行うことにより読取るようにしたので、従来問題を解決することができる。すなわち試薬容器には電磁波によって読取り可能な記憶媒体を設けるようにしたので、多くの試薬情報を持たせることができる。また試薬情報を読取る送受信手段を試薬吸引位置に配置して試薬吸引時の試薬情報を読取るので、試薬吸引時以外の試薬情報は不要となり余分なメモリ容量を必要としない。さらに電磁波によって試薬情報を読取るので結露の影響は受けない。

（実施例）

以下図面を参照して本発明の実施例を説明する。

第1図は本発明の自動化学分析装置の実施例を示す構成図で、1はサンプラ部で分析すべき試料を試料容器1aに収容して間欠的に試料容器1aを移動させている。3はサンプルアームで先端に保持しているプローブ3Aによって前記試料容器1aから試料を吸引し、軸3Bを支点して揺動運動を行うことにより反応部2の反応容器2aに分注する。反応部2には多数の反応容器2aが配置され、図示しない駆動源によって反応容器2aを一定のサイクルで矢印方向に間欠的に回転運動させている。3は試薬部で試薬が収容された多数の試薬容器3aをホルダー4に保持して間欠的に試薬容器3aを移動させている。

5は試薬アームで先端に保持しているプローブ5Aによって前記試薬容器3aから分析項目に応じた試薬を吸引し、軸5Bを支点として揺動運動を行うことにより反応部2の反応容器2aに分注する。

個々の試薬容器3aを保持しているホルダー4の外周面には第2図に示すように記憶媒体4aとして例えば半導体メモリがカードの形で取付けられており、この半導体メモリには試薬の個別情報が電磁波によって送受信可能に記憶されている。試薬情報としては必要な情報が記憶可能であり、例えば試薬名称，分析パラメータ，製造年月日，有効期間，試薬吸光度範囲，試薬残量，分注量等を記憶している。これによって試薬の個別情報を試薬と一体化して試薬自身に持たせることができる。半導体メモリはフレキシビリティを持つように形成することによって、どのような表面にも取付けることができる。

7は送受信装置で電磁波によって前記試薬容器

３ａの半導体メモリに記憶されている試薬情報を送受信可能に構成されており、この送受信装置７は試薬容器３ａから試薬を試薬アーム５によって吸引する位置に配置されてＣＰＵ（中央演算処理装置）１０の制御の基に試薬吸引時の試薬情報を記憶媒体４ａから電磁波によって読取るように動作する。読取られた試薬情報は送受信装置７によってＣＰＵ１０へ送信される。

８は撹拌部で反応容器２ａに分注された試料と試薬とが十分に反応するように撹拌動作を行う。９は測光部で反応容器２ａの移動経路の途中に配置され、反応容器２ａを挟んで光源９ａと検出器９ｂとが対向して設けられている。反応容器２ａが光源９ａの光路Ｌを遮ったとき反応液の吸光度が測定されることにより、所望項目の化学分析が行われる。

１０はＣＰＵ（中央演算処理装置）で全体の制御動作を司っており、特に本発明実施例の場合は送受信装置７の動作を制御すると共にこれから送信された試薬情報を受信して必要な制御を行うように構成されている。

次に本実施例の作用を説明する。

反応部２の反応容器２ａが回転運動してサンプラ部１に対向した位置に移動してくると、サンプルアーム３によって分析に必要な試料が試料容器１ａから吸引されて所定量分注される。続いてこの反応容器２ａが試薬部３に対向した位置に移動してくると、試薬アーム５によって分析項目に応じた試薬がホルダー４に保持されている試薬容器３ａから吸引されて所定量分注される。

このとき試薬部３の試薬吸引位置に配置されている送受信装置７は、ＣＰＵ１０の制御の基に試薬容器３ａに対応したホルダー４の記憶媒体４ａから試薬情報を電磁波によって読取ってＣＰＵ１０へ送信する。このように試薬吸引時は常にこの試薬情報が送受信装置７によって読取られてＣＰＵ１０へ送信されることにより、ＣＰＵ１０は試薬情報を直ちに検出して必要な制御動作を行うことができる。例えば途中で分析項目の変更要求があって予めセットされた試薬が他の試薬に交換されたような場合でも、常に試薬吸引時の試薬情報を検出してこれに応じた分析が行われるように制御することができる。

試薬が分注された反応容器２ａは撹拌部８によって撹拌された後、測光系９によって比色法によって吸光度が測定されることにより所望項目が分析される。

このように本実施例によれば、試薬容器３ａのホルダー４に送受信装置７によって送受信可能となるように予め試薬情報が記憶された記憶媒体４ａを設け、試薬吸引時の試薬情報をこの記憶媒体４ａから電磁波によって読取るようにしたので、従来のような問題を解決することができる。すなわち試薬情報はバーコードを用いず電磁波によって読取るようにしたことによって、情報容量を飛躍的に増やすことが可能となり、多くの試薬情報を持たせることができる。また試薬情報を試薬自身に持たせ常に試薬吸引時における試薬情報を読取るようにしたので、分析途中で分析項目の変更依頼があって試薬を交換させるような場合でも、常に吸引時の試薬情報を検出することにより交換される試薬の個別情報をずっと記憶しておく必要はない。従って余分なメモリ容量は不要となるため、この分コストダウンを図ることができるようになる。さらに試薬情報は電磁波によって読取るため結露が試薬容器やホルダーに生じたとしても、何らこの影響を受けることはないので正常に読取ることができる。

本実施例では記憶媒体としてカード状の半導体メモリを用いる例で説明したが、第３図のようにフレキシブルな記憶媒体４ａを用いることによりこの取付面の形状に左右されることなく、湾曲状に取付けることもできる。あるいは記憶媒体は予めホルダーに埋込むようにしてもよい。このような記憶媒体は一般に普及しているＩＣカードのような各種媒体を利用することにより、新たに用意することなく実現することができる。さらに実施例のように記憶媒体はホルダーに設けることなく、第４図のように試薬容器３ａ自身に設けることも自在である。

〔発明の効果〕

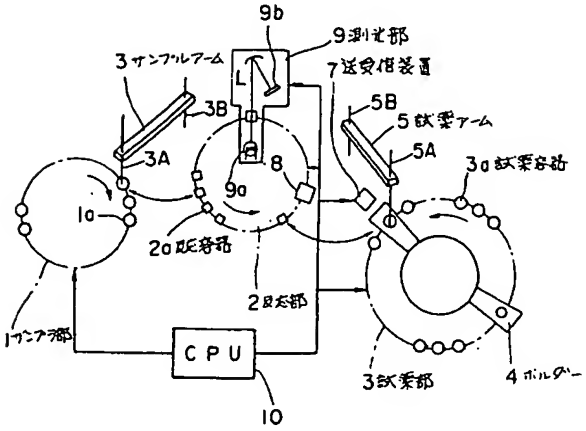
以上述べたように本発明によれば、試薬吸引時の試薬情報を電磁波によって読取るようにしたので、多くの情報容量を得ることができると共に不要なメモリ容量を省くことができ、さらに結露の影響を避けることができる。

4．図面の簡単な説明

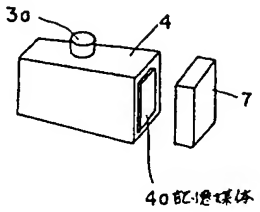
第１図は本発明の自動化学分析装置の実施例を示す構成図、第２図は本実施例装置の主要部を示す斜視図、第３図及び第４図は本実施例の変形例を示す斜視図、第５図は従来例を示す斜視図である。

２ａ…反応容器、３…試薬部、
３ａ…試薬容器、４…ホルダー、
４ａ…記憶媒体、７…送受信装置、
１０…ＣＰＵ（中央演算処理装置）。

代理人　弁理士　三　澤　正　義



第　１　図



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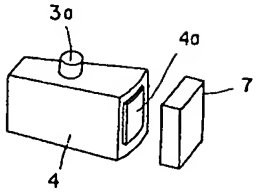
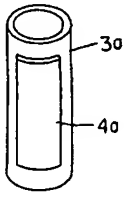
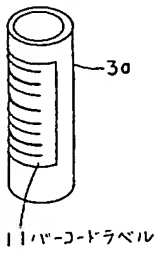


第　３　図



第　４　図



第　５　図

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Bibliography

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5K067

[F term (reference)]

5K067 BB04 DD11 DD57 EE02 EE10 EE16 HH07 JJ71

[Translation done.]

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Epitome

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(57) [Abstract]
[Technical problem] Improvement in the call-processing capacity of the digital mobile communication exchange [Means for Solution] In case the demand signal transmitted to a home memory station from a

call-processing control processor minds, the identifier given to a demand signal in a common-channel-signalling processing processor is memorized, and correspondence with a demand signal and a transmitting agency call-processing control processor is memorized. And at the time of the reply signal reception from a home memory station, it is made to carry out routing of the reply signal to a transmitting agency call-processing control processor by the common-channel-signalling processing processor correctly based on the identifier given to this and the identifier of the demand signal memorized in this way. Thereby, reduction of the dynamic steps of the call-processing control processor accompanying the communication link of the signal corresponding to un-[circuit] and reduction of a processing burden are aimed at, and improvement in call-processing capacity is aimed at.

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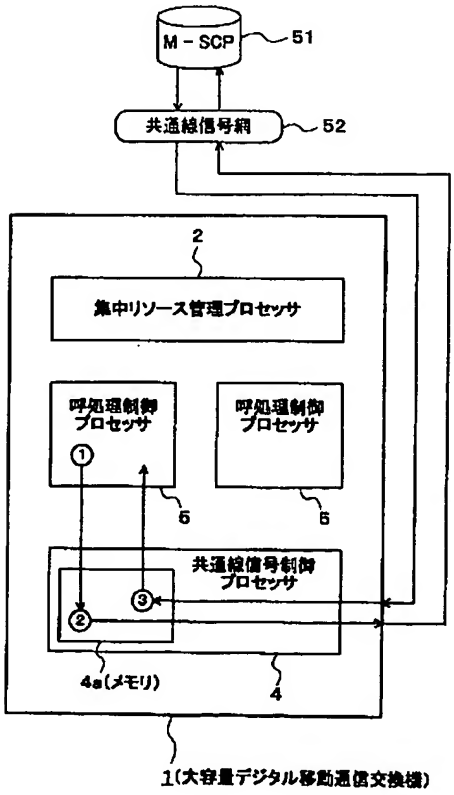

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CLAIMS

[Claim(s)]
[Claim 1] The digital mobile communication exchange which has the call-processing control processor which is characterized by providing the following, and which manages a call condition at least, and the common-channel-signalling processing processor which transmit and receive the signal corresponding to un-[circuit] by the common-channel-signalling line method between home memory stations The above-mentioned call-processing control processor is a demand signal generation means to generate the demand signal by the signal corresponding to un-[circuit] for requiring the data which are needed when performing call processing from the above-mentioned home memory station. An identifier grant means to give the identifier for identifying that it is the demand signal concerned to the demand signal generated by the above-mentioned demand signal generation means It is the means of communications to which it has a transmitting means to transmit the demand signal to which the identifier was given by the above-mentioned identifier grant means to the above-mentioned common-channel-signalling processing processor, and the above-mentioned common-channel-signalling processing processor makes possible data communication with the above-mentioned home memory station. An identifier storage means to memorize the identifier given to the above-mentioned demand signal by the above-mentioned identifier grant means according to receiving the demand signal transmitted from the above-mentioned transmitting means of the above-mentioned call-processing control processor, It responds to receiving the reply signal by the signal corresponding to un-[circuit] answered from the above-mentioned home memory station according to the demand signal transmitted by the above-mentioned means of communications. A signal routing control means corresponding to un-[circuit] to transmit the above-mentioned reply signal to the transmitting agency call-processing control processor of the above-mentioned demand signal based on the identifier given to the above-mentioned reply signal and the identifier memorized by the above-mentioned identifier storage means
[Claim 2] The call-processing control processor which manages a call condition at least The common-channel-signalling processing processor which transmits and receives the signal corresponding to un-[circuit] by the common-channel-signalling line method between home memory stations It is the signal routing approach corresponding to un-[circuit] of the digital mobile communication exchange equipped with the above. The demand signal generation procedure which generates the demand signal by the signal corresponding to un-[circuit] for requiring the data which are needed when performing call processing from the above-mentioned home memory station, The identifier grant procedure which gives

an identifier to the demand signal generated by the above-mentioned demand signal generation procedure in order to identify that it is the demand signal concerned, The transmitting procedure of transmitting the demand signal to which the identifier was given by the above-mentioned identifier grant procedure to the above-mentioned common-channel-signalling processing processor, It responds to receiving the demand signal transmitted by the above-mentioned transmitting procedure of the above-mentioned call-processing control processor. The identifier storage procedure of memorizing the identifier given to the above-mentioned demand signal by the above-mentioned identifier grant procedure in the above-mentioned common-channel-signalling processing processor, It responds to receiving the reply signal by the signal corresponding to un-[circuit] answered from the above-mentioned home memory station according to the above-mentioned demand signal. It is characterized by performing the signal routing control procedure corresponding to un-[circuit] of transmitting the above-mentioned reply signal to the transmitting agency call-processing control processor of the above-mentioned demand signal, based on the identifier given to the above-mentioned reply signal and the identifier memorized by the above-mentioned identifier storage procedure.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the signal routing approach corresponding to un-[circuit] of the digital mobile communication exchange and the digital mobile communication exchange.
[0002]
[Description of the Prior Art] Conventionally, various carriers are carrying out digital mobile service represented by cell phone service with development of communication technology. Thereby, generally various mobile communication, such as a migration message by the cellular phone, is performed. Such digital mobile service is realized by the system as shown in drawing 1 .

[0003] Drawing 1 is drawing showing the example of a configuration of digital migration communication system. The digital migration communication system shown in this drawing is equipped with the migration terminal 60 (60a), a base transceiver station (BS) 55, the mobile communication exchange (MSC:Mobile Switching Center) 50, the gateway exchange (G-MSC:Gate Mobile Switching Center) 53, the common-channel-signalling network 52, and the home memory station (mobile service control station M-SCP:Mobile ServiceControl Point) 51, and is constituted.

[0004] The gateway exchange 53 is formed in order to exchange the communication link between each migration terminal 60 (60a), and the communication link with other networks 54. It connects with the home memory station 51 through the common-channel-signalling network 52, and, thereby, the communication link with the home memory station 51 of this gateway exchange 53 is enabled so that it may illustrate. Moreover, it connects with each mobile communication exchange 50 and other networks 54, and the communication link with these mobile communication exchange 50 and other networks 54 of the gateway exchange 53 is also enabled.

[0005] The mobile communication exchange 50 has the digital mobile communication exchange, and is constituted. It connects with the home memory station 51 through the common-channel-signalling network 52 so that it may illustrate, and this mobile communication exchange 50 is made possible [performing the communication link by the signal corresponding to un-/ circuit / the home memory station 51 and]. Moreover, through a base transceiver station 55, the communication link with the migration terminal 60 is also enabled, and, thereby, this mobile communication exchange 50 becomes that the mobile communication exchange 50 can perform call processing based on the dispatch demand signal from the migration terminal 60, or the terminating signal from other mobile communication exchanges 50. Moreover, in connection with the migration terminal 60 under communication link moving, also when a communication link straddles among each mobile communication exchange 50, the mobile communication exchange 50 also performs automatic-tracking routing (tracking telephone exchange: the so-called handover) which pursues the migration terminal 60 under communication link so that a communication link may not stop.

[0006] The information (customer information) about all the users using this migration communication system is memorized by the home memory station (mobile service control station) 51. And this information is used for overall control of this migration communication system. For example, the information about a communication link tariff is assigned and memorized every migration terminal 60 in this home memory office 51. And whenever each migration terminal 60 communicates, it is made to be updated, and it enables it to deduce this information by this in the communication link tariff according to use of each migration terminal 60 (user). Moreover, the positional information transmitted to the home memory station 51 at any time from the migration terminal 60 (minding the mobile communication exchange 50) is also memorized, and this positional information is used for the location registration for the arrival in each migration network (each mobile communication exchange 50).

[0007] Thus, in the migration communication system constituted, when the dispatch demand from the

migration terminal 60 arises, it is received by the mobile communication exchange 50 where the dispatch signal from the migration terminal 60 corresponds through the nearby base transceiver station 55 first. Thus, reception of the dispatch signal from the migration terminal 60 generates call processing at this mobile communication exchange 50. And at the mobile communication exchange 50, in order to collect the required customer information about this migration terminal 60, signal processing of the received dispatch signal corresponding to un-[edit and / circuit] is carried out, the data demand signal over the home memory station 51 is generated, and this is transmitted to the home memory station 51 through the common-channel-signalling network 52. In the home memory station 51, the reply signal which indicated the demanded data is generated based on the contents of this demand signal, and this reply signal is answered by the mobile communication exchange 50.

[0008] At the mobile communication exchange 50 which received the reply signal, security checks, such as terminal authentication, are performed about the migration terminal 60 of a sending agency based on the data indicated by this reply signal. And termination of this security check performs channel setup between the migration terminals 60 at the mobile communication exchange 50 according to this.

[0009] Here, as for the mobile communication exchange 50, the terminal used as the dispatch demand place of the migration terminal 60 transmits a terminating signal through the gateway exchange 53 with the above-mentioned channel setup processing to the mobile communication exchange 50 of a phase hand's migration terminal 60a where a ** area is carried out, when it is migration terminal 60a in the same network. If a phase hand's mobile communication exchange 50 applies a call to a phase hand's migration terminal 60a and has the reply of a reply signal according to this, it will transmit this to the mobile communication exchange 50 by the side of the sending agency migration terminal 60. Moreover, the mobile communication exchange 50 where migration terminal 60a carries out a ** area performs a security check and channel setup processing to this and coincidence between migration terminal 60a.

[0010] And if the above-mentioned reply signal is received by the migration terminal 60 of a sending agency through the gateway exchange 53 and the mobile communication exchange 50, a communication link will come to be started between these migration terminal 60 and migration terminal 60a.

[0011] Moreover, also when the terminal used as the dispatch demand place of the migration terminal 60 is a terminal in a network 54, the mobile communication exchange 50 transmits a dispatch signal through the gateway exchange 53 to other networks 54 with the above-mentioned channel setup processing first. And if there is a reply of a reply signal from other networks 54, the mobile communication exchange 50 will transmit this reply signal to the migration terminal 60, and, thereby, a communication link will come to be started.

[0012] Thus, when the started communication link is completed, according to this, information, such as a communicative notice of termination and communication link time amount, is edited as a signal corresponding to un-[circuit] at the mobile communication exchange 50, and this is transmitted to the home memory station 51. This ends call processing about the communication link concerned in the

mobile communication exchange 50. And in the home memory station 51, information, such as a communication link tariff corresponding to the migration terminal 60 which sent, will be updated according to this.

[0013] by the way, in order to perform this call processing based on the dispatch demand signal from the migration terminal 60 etc. so that it may obtain and the above-mentioned explanation may also show in digital migration communication system [like], the mobile communication exchange 50 is formed. And in this mobile communication exchange 50, the digital mobile communication exchange is formed as a device for performing this call processing.

[0014] In the former, the thing of a configuration as shown in drawing 8 was used as the digital mobile communication exchange prepared for this mobile communication exchange 50. In drawing 8 , a common memory 102, two or more call-processing control processors 101, the interprocessor communication switch (P communication link switch) 103, and the common-channel-signalling processing processor 104 are formed in the conventional digital mobile communication exchange 100 so that it may illustrate.

[0015] First, a common memory 102 is memory which each call-processing control processor 101 shares, and common call status information, translation data, etc. are memorized by this common memory 102 between each call-processing control processor 101.

[0016] The common-channel-signalling processing processor 104 performs input/output control of the signal corresponding to un-[circuit] by the home memory station 51 which is not illustrated and the common-channel-signalling (NO.7) method of a between, and analysis processing of the signal corresponding to un-[circuit]. It connects with each call-processing control processor 101 through P communication link switch 103, and, thereby, transfer of the signal corresponding to un-[circuit] etc. of this common-channel-signalling processing processor 104 is enabled between the call-processing control processors 101.

[0017] Each call-processing control processor 101 performs management of a call condition, and call connection processing. This call-processing control processor 101 is connected with a common memory 102 through P communication link switch 103 so that it may illustrate. Moreover, as it described above, it connects with the common-channel-signalling processing processor 104, and the call-processing control processor 101 is made possible [delivering and receiving the data based on the signal corresponding to un-/ the home memory station 51 and / circuit / through this common-channel-signalling processing processor 104]. As the call-processing control processor 101 is explained below, it enables it to collect information required for call processing from the home memory office 51 by this.

[0018] Drawing 9 is drawing explaining routing processing actuation of the signal corresponding to un-[circuit] in the digital mobile communication exchange 100 by the above-mentioned configuration. In addition, in this drawing, it considers as the thing of explanation which omits and shows P communication link switch 103 for convenience. First, in this drawing, in order to receive a dispatch signal as it explained previously, and to perform the security check of the sending agency migration

terminal 60, suppose that data demand processing of the customer information over the home memory station 51 etc. occurred. If it responds to this, in processing ** to illustrate, the call-processing control processor 101 which this demand processing generated edits the signal corresponding to un-[circuit] according to the contents of this demand processing, and, thereby, generates the demand signal over the home memory station 51. Under the present circumstances, the identification number for identifying the demand signal concerned to a demand signal depending on this edit processing is given.

[0019] In this processing **, the call-processing control processor 101 transmits the signal corresponding to un-[circuit] as a demand signal which carried out in this way and was generated to the common-channel-signalling processing processor 104 through P communication link switch 103. Moreover, with this, the call-processing control processor 101 writes the identification number for identifying the demand signal given as described above in storage region 102a corresponding to an identification number in a common memory 102 so that it may illustrate.

[0020] Moreover, after this processing ** is completed, it is made for the call-processing control processor 101 to have the actuation which supervises periodically whether the reply signal over the demand signal concerned was answered from the home memory station 51 started to a common memory 102 in processing ** to illustrate.

[0021] In processing ** to illustrate, the common-channel-signalling processing processor 104 transmits this demand signal to the home memory station 51 through the common-channel-signalling network 52 according to receiving a demand signal from the call-processing control processor 101 as mentioned above.

[0022] In the home memory station 51 which received the demand signal, the required information according to the contents of the demand signal is edited, and, thereby, the signal corresponding to un-[circuit] as a reply signal is generated. And this reply signal is answered to the mobile communication exchange 100. Under the present circumstances, the data identification number given to the demand signal is given as it is, and this reply signal is answered by the mobile communication exchange 100.

[0023] The common-channel-signalling processing processor 104 receives in processing ** illustrating the reply signal answered by doing in this way, and transmits this to the call-processing control processor 101 of arbitration. The call-processing control processor 101 of the arbitration which received this reply signal writes this reply signal (required information) in data identification number correspondence in processing ** at a common memory 102 based on the data identification number given to the received reply signal. Moreover, this call-processing control processor 101 accesses storage region 102a corresponding to a data identification number, and sets the flag of the purport that the reply signal was received to the data identification number concerned as this and coincidence.

[0024] As explained previously, the requiring agency call-processing control processor 101 which is supervising whether the reply signal is periodically received on the common memory 102 in processing ** will read the reply signal which corresponds from a common memory 102 in processing **, if the flag set up as mentioned above received [data] is detected. That is, it means that the requiring agency call-

processing control processor 101 had collected the reply signals corresponding to a demand signal by this.

[0025] In the conventional digital mobile communication exchange 100, routing of the reply signal (required information) from the home memory station 51 comes to be correctly carried out to the call-processing control processor 101 which data demand processing generated by processing of such each part. And thereby, each call-processing control processor 101 becomes possible [performing various call processing].

[0026] By the way, in the **** migration communication system explained by drawing 1 , since it corresponds to the increment in the traffic density accompanying the increment in a subscriber in recent years, the mass digital mobile communication exchange 1 with a comparatively high throughput will be used rather than the digital mobile communication exchange 100 which gave [above-mentioned] explanation.

[0027] The configuration of this mass digital mobile communication exchange 1 is shown in drawing 10 . In drawing 10 , the intensive resource management processor 202, two or more call-processing control processors 205, P communication link switch 203, and the common-channel-signalling processing processor 204 are formed in the mass digital mobile communication exchange 200 so that it may illustrate.

[0028] The configuration of this mass digital mobile communication exchange 200 will become almost equivalent to the conventional digital mobile communication exchange 100 so that it may understand as compared with drawing 9 . That is, although the throughput of each part of the mass digital mobile communication exchange 200 shown in this drawing 11 is improving, that role will become almost equivalent to the case of drawing 9 . However, the function manager should be added to the intensive resource management processor 2 by the common memory 102 of drawing 9 . In this [200], i.e., this mass digital mobile communication exchange, it is constituted so that processor management of the common memory shared between interprocessor may be carried out by this intensive resource management processor 202.

[0029]

[Problem(s) to be Solved by the Invention] Here, as drawing 9 explained, when a call occurs depending on the routing approach in the conventional digital mobile communication exchange 100 and the demand signal over the home memory office 51 is sent out, processing (drawing 9 processing **) which supervises whether there was any reply of the reply signal from the home memory office 51 according to this demand signal from the call-processing control processor 101 to a common memory 102 will be performed. As **** was also carried out, it will be periodically carried out until this processing has the reply of a reply signal, and access to a common memory 102 from the call-processing control processor 101 will be performed several times in the meantime. That is, in the conventional approach, access to a common memory 102 from the call-processing control processor 101 will be performed two or more times for every one demand signal transmitting processing.

[0030] For this reason, the conventional signal routing approach corresponding to un-[circuit] makes the dynamic step of the call-processing control processor 101, such as access to the common memory 102 by each call-processing control processor 101, remarkably increased in connection with the supply traffic density to the digital mobile communication exchange 100 increasing.
[0031] Moreover, a reply signal is made for a letter to be answered by the transmitting agency call-processing control processor 101 through the call-processing control processor 101 of arbitration, and a common memory 102 at the time of the reply signal reception from the home memory office 51 so that explanation of drawing 9 may also show depending on the conventional approach. For this reason, in connection with this, the count of a communication link of each interprocessor will also increase remarkably.
[0032] Thus, in connection with supply traffic density increasing, the conventional signal routing approach corresponding to un-[circuit] makes the dynamic step of the call-processing control processor 101, and the count of interprocessor communication increase remarkably, and if it becomes the factor which reduces remarkably the call-processing capacity of the digital mobile communication exchange 100, it can be said.
[0033] Moreover, also in the mass digital mobile communication exchange 200 whose throughput improved as compared with the conventional digital mobile communication exchange 100, when following the conventional signal routing approach corresponding to un-[circuit], the same problem as this digital mobile communication exchange 100 will arise. That is, access to the it is alike, therefore according to call-processing control processor 205 intensive resource management processor 202 which traffic density increases increases remarkably by performing monitor processing to the intensive resource management processor 202 from the call-processing control processor 205, as it is shown in processing ** of drawing 11 also in this case. Moreover, as shown in processing ** and **, two or more interprocessor accesses will arise also in this case at the time of the reply signal reception from the home memory station 51, and the count of access of interprocessor increases remarkably with the increment in supply traffic density.
[0034] Also although it says that the throughput of each part was raised in the case of this mass digital mobile communication exchange 200, and it corresponded to the increment in traffic density, when the conventional signal routing approach corresponding to un-[circuit] is followed in this way, it may become impossible therefore, to fully pull out the throughput over a supply call.
[0035]
[Means for Solving the Problem] It was presupposed that this invention is constituted as follows as the digital mobile communication exchange which has the call-processing control processor which manages a call condition at least, and the common-channel-signalling processing processor which transmit and receive the signal corresponding to un-[circuit] by the common-channel-signalling line method between home memory stations that such a trouble should be solved. First namely, to the above-mentioned call-processing control processor A demand signal generation means to generate the demand signal by the

signal corresponding to un-[circuit] for requiring the data which are needed when performing call processing from the above-mentioned home memory station, An identifier grant means to give the identifier for identifying that it is the demand signal concerned to the demand signal generated by the above-mentioned demand signal generation means, It has a transmitting means to transmit the demand signal to which the identifier was furthermore given by the above-mentioned identifier grant means to the above-mentioned common-channel-signalling processing processor. and to the above-mentioned common-channel-signalling processing processor It responds to receiving the demand signal transmitted from the means of communications which makes possible data communication with the above-mentioned home memory station, and the above-mentioned transmitting means of the above-mentioned call-processing control processor. An identifier storage means to memorize the identifier given to the above-mentioned demand signal by the above-mentioned identifier grant means, Furthermore, it responds to receiving the reply signal by the signal corresponding to un-[circuit] answered from the above-mentioned home memory office according to the demand signal transmitted by the above-mentioned means of communications. Based on the identifier given to the above-mentioned reply signal and the identifier memorized by the above-mentioned identifier storage means, it had a signal routing control means corresponding to un-[circuit] to transmit the above-mentioned reply signal to the transmitting agency call-processing control processor of the above-mentioned demand signal.

[0036] Moreover, in this invention, it considered as things making it be the following as the signal routing approach corresponding to un-[circuit] of the above-mentioned digital mobile communication exchange. Namely, the demand signal generation procedure which generates the demand signal by the signal corresponding to un-[circuit] for requiring the data which are needed to the above-mentioned home memory station first when performing call processing is performed. The identifier grant procedure which gives the identifier for identifying that it is the demand signal concerned to the demand signal generated by the above-mentioned demand signal generation procedure, The transmitting procedure of transmitting the demand signal to which the identifier was given by the above-mentioned identifier grant procedure to the above-mentioned common-channel-signalling processing processor is performed. And it responds to receiving the demand signal transmitted by the above-mentioned transmitting procedure of the above-mentioned call-processing control processor. It is made to perform the identifier storage procedure of memorizing the identifier given to the above-mentioned demand signal by the above-mentioned identifier grant procedure in the above-mentioned common-channel-signalling processing processor. On it It responds to receiving the reply signal by the signal corresponding to un-[circuit] answered from the above-mentioned home memory station according to the above-mentioned demand signal. Based on the identifier given to the above-mentioned reply signal and the identifier memorized by the above-mentioned identifier storage procedure, it was made to perform the signal routing control procedure corresponding to un-[circuit] of transmitting the above-mentioned reply signal to the transmitting agency call-processing control processor of the above-mentioned demand signal.

[0037] If it is performed above, in case the demand signal transmitted to a home memory station from a call-processing control processor minds a common-channel-signalling processing processor as the digital mobile communication exchange and its signal routing approach corresponding to un-[circuit], it becomes possible to memorize the identifier given to a demand signal and to memorize correspondence with a demand signal and a transmitting agency call-processing control processor by the common-channel-signalling processing processor. Moreover, at the time of the reply signal reception from a home memory station, a common-channel-signalling processing processor enables it to carry out routing of the reply signal to a transmitting agency call-processing control processor correctly based on the identifier given to this reply signal and the identifier of the demand signal memorized as mentioned above.

[0038] That is, it is only access which the signal transmission and reception between a call-processing control processor and a common-channel-signalling processing processor take depending on this invention, and it becomes possible to perform routing of the signal corresponding to un-[circuit]. This becomes possible in the time of the signal routing processing corresponding to un-[circuit] to reduce sharply the increment in the dynamic step of the call-processing control processor accompanying the increment in supply traffic density, and the count of a communication link of interprocessor as compared with the former depending on this invention.

[0039]

[Embodiment of the Invention] Drawing 1 is drawing showing the example of a configuration of digital migration communication system. First, this digital migration communication system is equipped with the migration terminal 60 (60a), a base transceiver station (BS) 55, the mobile communication exchange (MSC:Mobile SwitchingCenter) 50, the gateway exchange (G-MSC:Gate Mobile Switching Center) 53, the common-channel-signalling network 52, and the home memory station (mobile service control station M-SCP:Mobile Service Control Point) 51, and is constituted so that it may illustrate. In addition, the actuation obtained by the digital migration communication system constituted in this way is as having explained previously.

[0040] Then, the configuration of the mass digital mobile communication exchange 1 as a gestalt of this operation established in the migration exchange 50 of this digital migration communication system is shown in drawing 2 . In drawing 2 , the intensive resource management processor 2, two or more call-processing control processors 5, the interprocessor communication switch (P communication link switch) 3, and the common-channel-signalling processing processor 4 are formed in this mass digital mobile communication exchange 1 so that it may illustrate.

[0041] First, common call status information, translation data, etc. are memorized by the intensive resource management processor 2 between the call-processing control processors 5. Moreover, this intensive resource management processor 2 manages I/O of such information etc.

[0042] The common-channel-signalling processing processor 4 performs input/output control of the signal corresponding to un-[circuit] by the home memory station 51 which is not illustrated and the

common-channel-signalling (NO.7) method of a between, and analysis processing of the signal corresponding to un-[circuit]. It connects with each call-processing control processor 5 through P communication link switch 3, and, thereby, transfer of the signal corresponding to un-[circuit] etc. of this common-channel-signalling processing processor 104 is enabled between the call-processing control processors 5. Moreover, in the case of the gestalt of this operation, memory 4a is prepared in this common-channel-signalling processing processor 4 so that it may illustrate, but about this, it mentions later.

[0043] Each call-processing control processor 5 performs management of a call condition, and call connection processing. This call-processing control processor 5 is connected with the intensive resource management processor 2 through P communication link switch 3 so that it may illustrate. Moreover, the call-processing control processor 5 is made possible [delivering and receiving the data based on the signal corresponding to un-/ the home memory station 51 and / circuit / through this common-channel-signalling processing processor 4] by connecting with the common-channel-signalling processing processor 4, as it described above. As it explains below, it enables it to collect the call-processing control processors 5 from the home memory office 51 in information required for call processing by this.

[0044] Drawing 3 is a flow chart explaining actuation of each part of the mass digital mobile communication exchange 1 at the time of the communication link of the signal corresponding to un-[circuit] of a between [the home memory offices 51]. First, in step S101, if call processing is started so that it may illustrate, the call-processing control processor 5 will start data demand processing of the customer information over the home memory station 51 etc. in order to perform the security check of the sending agency migration terminal 60.

[0045] If it responds to this, in continuing step S102, the signal corresponding to un-[circuit] according to the contents of this demand processing is edited, and this generates the demand signal over the home memory station 51. Moreover, the identification number for identifying the demand signal concerned to a demand signal is given to the call-processing control processor 5 in this case. This identification number is given as a transaction ID of the transaction section in a format of the signal corresponding to un-[circuit], as shown in drawing 4 .

[0046] The call-processing control processor 5 transmits the signal corresponding to un-[circuit] as a demand signal which carried out in this way and was generated to the common-channel-signalling processing processor 4 through P communication link switch 3 in continuing step S103.

[0047] The common-channel-signalling processing processor 4 receives the demand signal transmitted from the call-processing control processor 5 as mentioned above in step S201. And in step S202, the identification number given to this demand signal is written in to memory 4a explained by drawing 2 , and this is memorized.

[0048] Here, in case the common-channel-signalling processing processor 4 carried out the field division of this memory 4a, has managed it every call-processing control processor 5 and writes in an identification number in this step S202, it is written in the field corresponding to the call-processing

control processor 5 of this identification number demand-origin.
[0049] The common-channel-signalling processing processor 4 will transmit the demand signal of a step S203 smell lever to the home memory station (M-SCP) 51 through the common-channel-signalling network 52, if an identification number is memorized to memory 4a in step S202 in this way.
[0050] In the home memory station 51 which received the demand signal, the required information according to the contents of the demand signal is edited, and, thereby, the signal corresponding to un-[circuit] as a reply signal is generated in this home memory station 51. And this reply signal is answered to the mass digital mobile communication exchange 1. Under the present circumstances, the identification number given to the demand signal at this reply signal is given as it is, and is answered by the mass digital mobile communication exchange 1.
[0051] The common-channel-signalling processing processor 4 receives the reply signal answered by doing in this way in step S204, and obtains coincidence with the identification number given to this reply signal in continuing step S205, and the identification number memorized in memory 4a. Namely, although he is trying to write an identification number in the field corresponding to the call-processing control processor 5 of a requiring agency to memory 4a in step S202 as this common-channel-signalling processing processor 4 was explained previously It is made possible [specifying the call-processing control processor 5 which should answer a letter in a reply signal by obtaining coincidence with the identification number moreover given to the reply signal in this step S205, and the identification number memorized by this memory 4a].
[0052] Thus, if the requiring agency call-processing control processor 5 is specified in step S205, in step S206, a reply signal will be transmitted to this requiring agency call-processing control processor 5 through P communication link switch 3.
[0053] It means that the call-processing control processor 5 which is a requiring agency receives the reply signal of a step S104 smell lever, and the reply signals corresponding to a demand signal had been collected by this call-processing control processor 5 by this.
[0054] Routing of the required information (reply signal) from the home memory station 51 comes to be correctly carried out to the call-processing control processor 5 which data demand processing generated by processing of such a call-processing control processor 5 and the common-channel-signalling processing processor 4, and, thereby, each call-processing control processor 5 becomes possible [performing various call processing] by it.
[0055] The above is explanation about the mass digital mobile communication exchange 1 as a gestalt of this operation. As **** was also carried out, in case the demand signal from the call-processing control processor 5 is transmitted to the home memory station 51 in the mass digital mobile communication exchange 1 of the gestalt of this operation, the recognition signal given to this demand signal is memorized by each call-processing control processor 5 correspondence in memory 4a by the common-channel-signalling processing processor 4. And when the reply signal from the home memory station 51 is answered by this common-channel-signalling processing processor 4, based on the

identification number memorized as mentioned above at memory 4a, and the identification number given to the reply signal, the requiring agency call-processing control processor 5 is specified by it.
[0056] If the actuation in the mass digital mobile communication exchange 1 of the gestalt of such this operation is shown typically, it will become like drawing 5 . In addition, in this drawing, it considers as the thing of explanation which omits and shows P communication link switch 3 for convenience. Processing of the call-processing control processor 5 which the transmission and reception of the signal corresponding to un-[circuit] to the home memory office 51 take in this case turns into only transceiver processing of a signal to the common-channel-signalling processing processor 4 shown as processing ** and processing ** so that this drawing 5 may also show. Moreover, also let the count of access of the interprocessor in this case be only the count of access which is similarly shown as processing ** and processing ** and which the communication link of the signal corresponding to un-[circuit] between the call-processing control processor 5-common-channel-signalling processing processors 4 takes.
[0057] That is, in the mass digital mobile communication exchange 1 of the gestalt of this operation, it will be lost with the increment in supply traffic density that the dynamic step of the call-processing control processor 5 and the count of access of interprocessor increase remarkably, and, thereby, it becomes possible to raise call-processing capacity sharply.
[0058] Here, it compares with the digital mobile communication exchange 100 by the conventional configuration shown in drawing 8 , and the signal routing approach corresponding to un-[circuit] further about the call-processing capacity of the digital mobile communication exchange 1 as a gestalt of this operation. As explained previously, compared with the conventional digital mobile communication exchange 100, the throughput of the mass digital mobile communication exchange 1 of the gestalt of this operation of each processor shall improve. And the processing burden of each part which transmission and reception of the signal corresponding to un-[circuit] take is made to mitigate sharply by applying on it the routing approach shown in drawing 3 . That is, compared with the digital mobile communication exchange 100 by which the digital mobile communication exchange 1 of the gestalt of this operation was used conventionally, mitigation of the processing burden of each part accompanying the improvement in the throughput in a hard side and routing actuation of the signal corresponding to un-[circuit] will be achieved. for this reason, it can be said that the digital mobile communication exchange 1 of the gestalt of this operation becomes what boiled call-processing capacity markedly and raised it compared with the conventional digital mobile communication exchange 100 shown in drawing 8 .
[0059] Moreover, it is also possible to apply as a modification the signal routing approach corresponding to un-[circuit] which was explained by drawing 3 to the digital mobile communication exchange 10 currently used conventionally as a gestalt of this operation.
[0060] First, the configuration of this digital mobile communication exchange 10 interior is shown in drawing 6 . In addition, in this drawing, the sign same about the part already explained in drawing 2 is attached, and explanation is omitted. This digital mobile communication exchange 10 is considered as a

configuration almost equivalent to the mass digital mobile communication exchange 1 so that it may understand as compared with drawing 2 . However, it should be omitted in the memory management function of the intensive resource management processor 2 which shows the common memory 12 shown in drawing 6 in this case in drawing 2 .

[0061] Thus, when drawing which explains typically actuation of each part at the time of applying the signal routing approach corresponding to un-[circuit] explained by drawing 3 to the digital mobile communication exchange 10 constituted is shown in drawing 7 , the same actuation as the mass digital mobile communication exchange 1 will be obtained so that it may understand also in this case as compared with drawing 5 . That is, also in this digital mobile communication exchange 10, it becomes possible to raise that call-processing capacity.

[0062] By the way, these conventional digital mobile communication exchanges 10 differ in the mass digital mobile communication exchange 1 of drawing 2 , and as they also carried out ****, they are considered as the configuration which omitted management of the common resource (memory) of each call-processing control processor in a common memory 12. In this [10], i.e., the conventional digital mobile communication exchange, it means having the composition of burdening the call-processing control processor 15 and the common-channel-signalling processing processor 14 with processing at this rate.

[0063] Here, the case where the signal routing approach corresponding to un-[circuit] of this invention is applied is considered to the digital mobile communication exchange 10 constituted in this way. It is made for the routing approach of this invention to have the routing processing of the signal corresponding to un-[circuit] mainly performed by the common-channel-signalling processing processor so that it may understand with reference to the flow chart of drawing 3 . On the other hand, as described above, the conventional digital mobile communication exchange 10 is considered as the configuration in which the processing in the common-channel-signalling processing processor 14 serves as a heavy-loading inclination from the case of the common-channel-signalling processing processor 4 in the mass digital mobile communication exchange 1. Therefore, in applying the signal routing approach corresponding to un-[circuit] of this invention to the digital mobile communication exchange 10 in this way, compared with the case of the mass digital mobile communication exchange 1, the processing burden in the common-channel-signalling processing processor 14 will increase, and it cannot say that there is no case where the effectiveness of the improvement in call-processing capacity becomes small as this result.

[0064] For this reason, the signal routing approach corresponding to un-[circuit] of this invention can be said to be an effective approach in fact by the direction of the mass digital mobile communication exchange 1 by which mitigation of processing of a call-processing control processor and a common-channel-signalling processing processor was achieved rather than the conventional digital mobile communication exchange 10 as shown in drawing 6 .

[0065] In addition, although the example which realizes with software signal routing actuation

corresponding to un-[circuit] shown in drawing 3 is given with the gestalt of this operation, it is also possible to realize this by hardware.

[0066]

[Effect of the Invention] As mentioned above, in case the demand signal transmitted to a home memory station from a call-processing control processor minds a common-channel-signalling processing processor, this invention memorizes the identifier given to a demand signal in this common-channel-signalling processing processor, and he is trying to memorize correspondence with a demand signal and a transmitting agency call-processing control processor. Moreover, based on the identifier given to a reply signal by this common-channel-signalling processing processor at the time of the reply signal reception from a home memory station, and the identifier of the demand signal memorized as mentioned above, it is made to carry out routing of the reply signal to a transmitting agency call-processing control processor correctly.

[0067] That is, this invention is only access which the signal transmission and reception between a call-processing control processor and a common-channel-signalling processing processor take, and makes it possible to perform routing of the signal corresponding to un-[circuit]. This becomes possible to reduce sharply the dynamic step of the call-processing control processor accompanying the increment in the supply traffic density at the time of the signal routing processing corresponding to un-[circuit], and the increment in the count of interprocessor communication as compared with the former depending on this invention.

[0068] Consequently, while becoming possible to raise call-processing capacity sharply depending on this invention, it becomes possible to supply the system which was made to mitigate the load of each processor and was stabilized more.

[Translation done.]

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1.This document has been translated by computer. So the translation may not reflect the original precisely.

2.**** shows the word which can not be translated.

3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is drawing showing the example of a configuration of digital migration communication system.
[Drawing 2] It is the block diagram having shown the configuration in the mass digital mobile communication exchange as a gestalt of this operation.
[Drawing 3] It is a flow chart explaining actuation of each part of the mass digital mobile communication exchange at the time of the communication link of the signal corresponding to un-[circuit].
[Drawing 4] It is drawing showing the example of a format of the signal corresponding to un-[circuit].
[Drawing 5] It is drawing showing typically actuation of each part in the mass digital mobile communication exchange as a gestalt of this operation.
[Drawing 6] It is the block diagram showing the configuration in the digital mobile communication exchange as a modification.
[Drawing 7] It is drawing showing typically actuation of each part in the digital mobile communication exchange as a modification.
[Drawing 8] It is the block diagram showing the configuration in the digital mobile communication exchange in the former.
[Drawing 9] It is drawing showing typically actuation of each part in the digital mobile communication exchange in the former.
[Drawing 10] It is the block diagram showing the configuration in the mass digital mobile communication exchange.
[Drawing 11] It is drawing showing actuation of each part of the mass digital mobile communication exchange at the time of following the conventional signal routing approach corresponding to un-[circuit].
[Description of Notations]
1 Mass Digital Mobile Communication Exchange, 2 4 Intensive Resource Management Processor, 3P Communication Link Switch, 14 Common-Channel-Signalling Processing Processor, 4a 5 Memory, 15 Call-Processing Control Processor, 50 Mobile Communication Exchange (MSC), 51 Home Memory Station (M-SCP), 52 Common-Channel-Signalling Network, 53 Gateway Exchange (G-MSC), 55 60 Base Transceiver Station (BS), 60a Migration Terminal

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[Translation done.]

* NOTICES *

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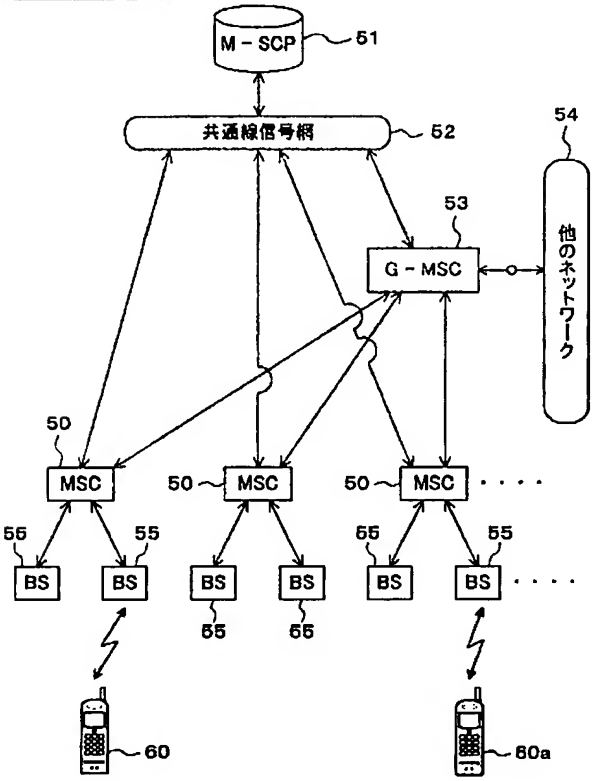
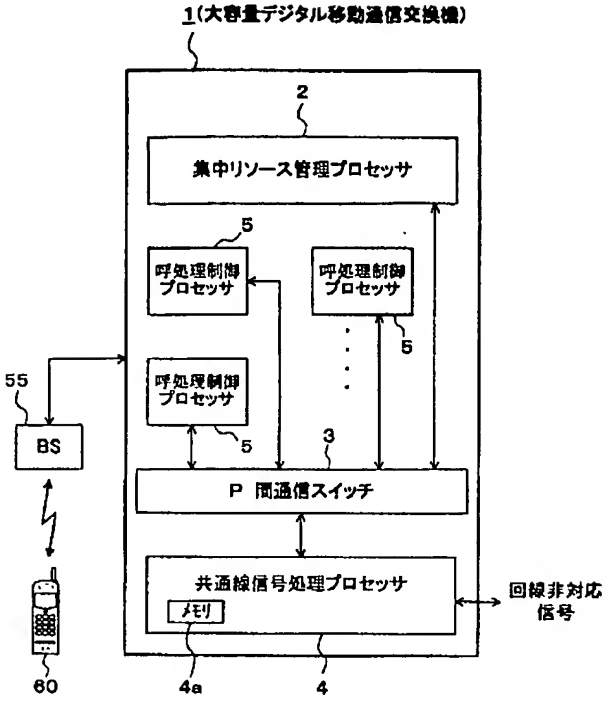
DRAWINGS

[Drawing 1]



[Drawing 2]



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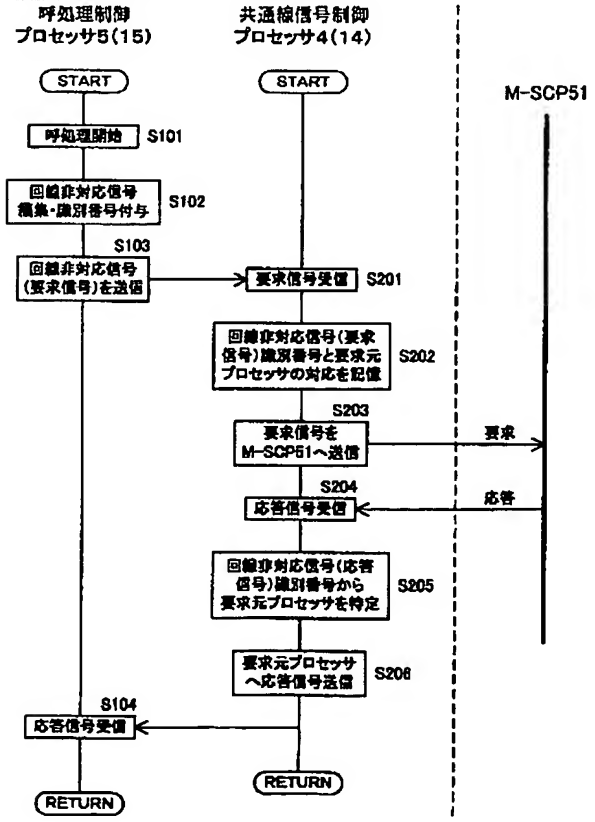

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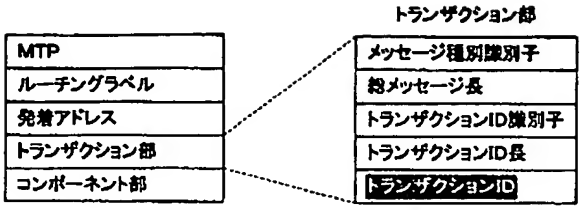
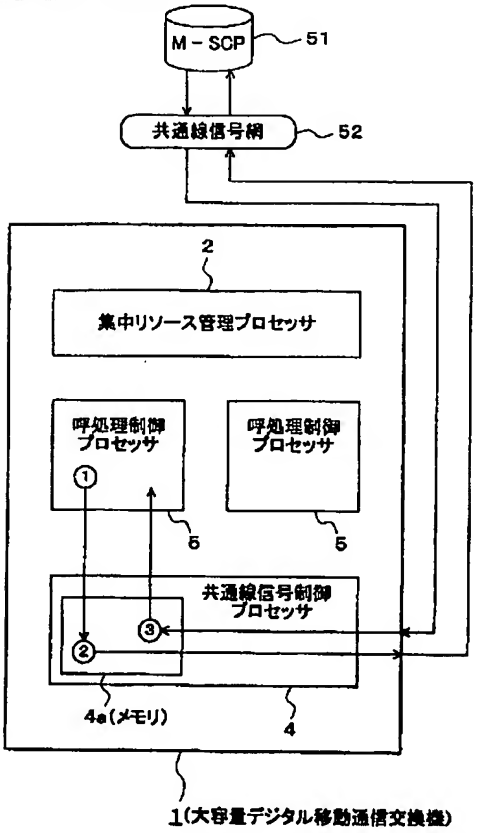


回線非対応信号のフォーマット

[Drawing 5]



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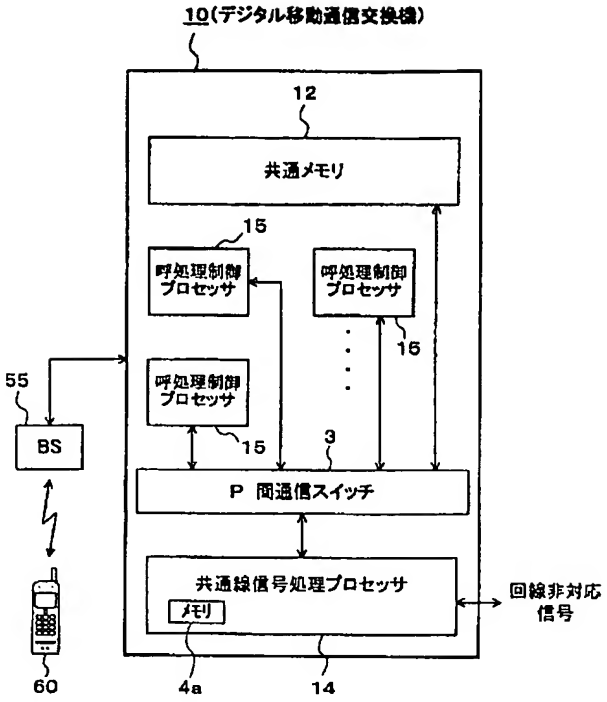
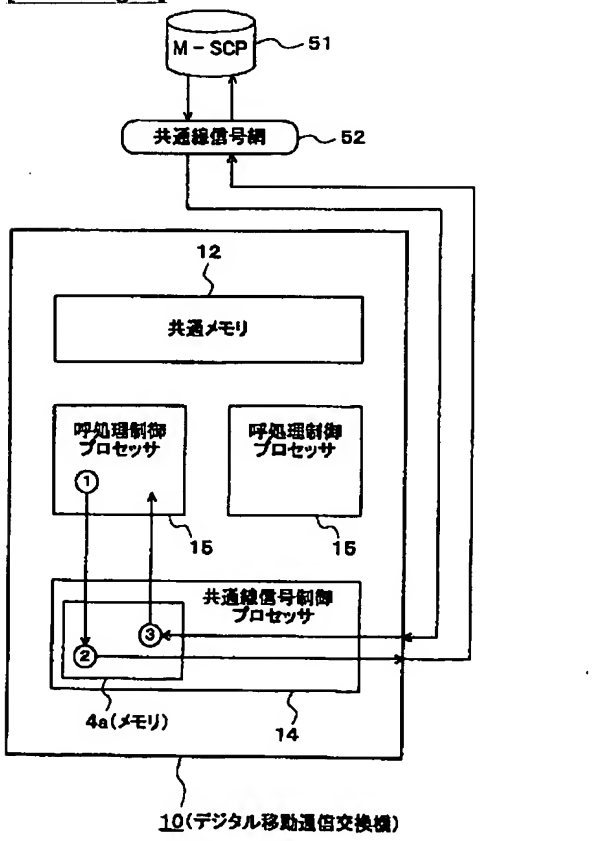
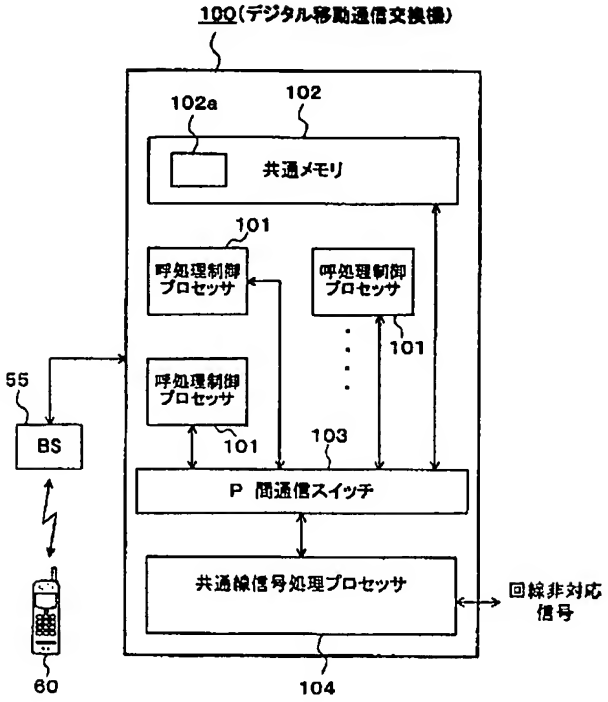


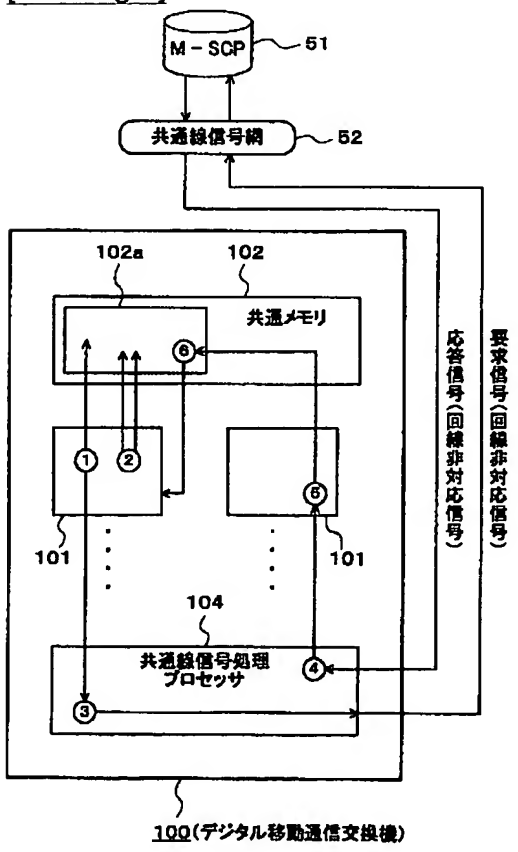
[Drawing 7]



[Drawing 8]



[Drawing 9]



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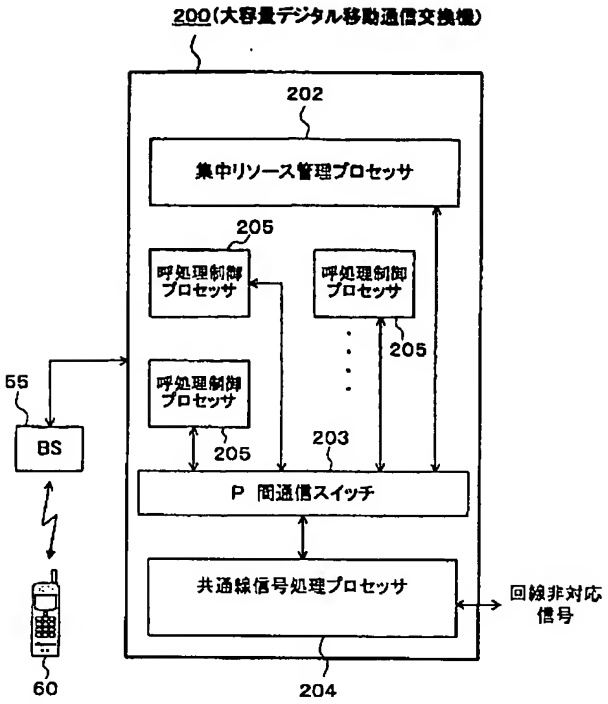
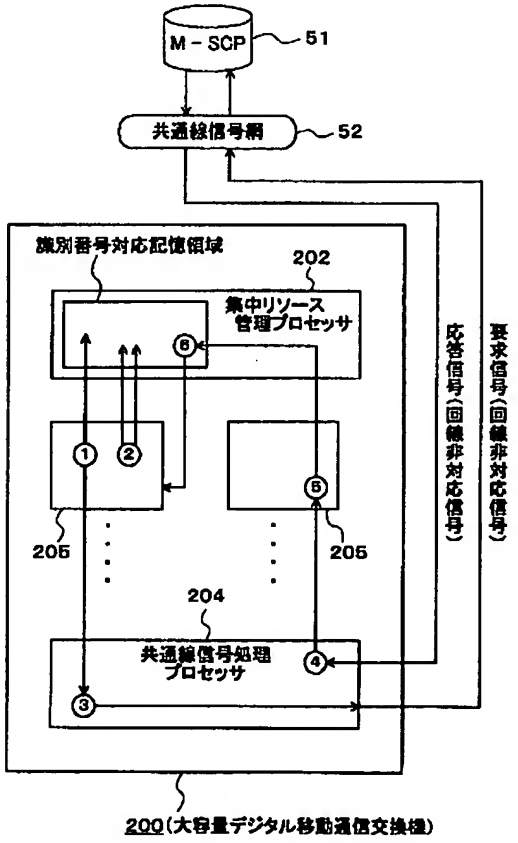


[Drawing 11]



[Translation done.]